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A comparison study of the WISC-III and WISC-R with a special education population

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A COMPARISON STUDY OF THE WISC-III AND WISC-R WITH
A SPECIAL EDUCATION POPULATION

A Field Project

Presented to the
Department of Psychology
and the
Faculty of the Graduate College
University of Nebraska

In Partial Fulfillment
of the Requirements for the Degree
Education Specialist in School Psychology
University of Nebraska at Omaha

by
Henry P. Green, Jr.

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FIELD PROJECT ACCEPTANCE

Acceptance for the faculty of the Graduate College,
University of Nebraska, in partial fulfillment of the
requirements for the degree Education Specialist in School
Psychology, University of Nebraska at Omaha.

Committee

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7/9/92
Date

Abstract

The purpose of this study was to determine the degree of comparability between the WISC-R and the WISC-III over a three year period. The subjects were 207 children, 124 Learning Disabled, 51 Mental Disabled, and 32 Behavior Disabled, enrolled in special education, in a large urban district (Omaha, Nebraska) and several rural districts in southwest Iowa. Results from the comparison study between WISC-III and WISC-R supports the hypothesis that students in the special education population tend to have significantly lower IQs on the WISC-III than the WISC-R. A significant decrease in Full Scale IQ scores was found in the mental disability group, but students in the behavior and learning disability groups had Full Scale IQ drops which were not significantly different from their normal peers. Although for all three disability groups WISC-III Verbal IQs dropped significantly more than their normal peers, there were no significant decreases in performance IQs. Because of the importance of having equivalent tests for diagnostic purposes, regression equations were obtained to predict WISC-III IQs from WISC-R scores for each group.

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A Comparison Study of the WISC-III and WISC-R with Special
Education Population

Since its revision in 1974, the Wechsler Intelligence Scale for Children-Revised Edition (WISC-R) is recognized as one of the most widely used, individually-administered intelligence tests (Sattler, 1988). It is well-established as a useful diagnostic tool in the area of educational assessment and in the appraisal of learning and other disabilities. A newer version of the Wechsler test--the Wechsler Intelligence Scale for Children-Third Edition (Wechsler, 1991)--promises to assume the same prominence in educational assessment.

Since children receiving special education services are typically given intelligence tests several times during their school years, and re-evaluation must be given every three years, in accordance with Public Law 94-142, the compatibility of different editions of a test is an important issue. Research has shown that whenever an intelligence test is renormed, there tends to be a drop in the intelligence score from the old version to the new (Doppelt & Kaufman, 1977; Flynn, 1984; Kaufman, 1990). An important question to answer is whether the WISC-III will yield IQ scores lower than the WISC-R, as previous research indicates?

The first issue concerning test comparability has to do with test structure: Is the composition of the samples used to norm the two tests similar? Are the two tests comparable in construction and administration?

The WISC-R norms were derived from a standardization sample that was representative of the U.S. population gathered from data in a 1970 U.S. Bureau of the Census study. This provided the basis for stratification along the following variables: age, gender, race/ethnicity, geographic region, and parent's education. The standardization sample of 2200 cases included 200 children in each of 11 age groups ranging from ages 6 through 16. The median age for each group was the sixth month (e.g., 6 years, 6 months; 7 years, 6 months, etc.) The sample included 100 males and 100 females in each group. For each age group in the standardization sample, the proportions of Whites, Blacks, Hispanics, and other race/ethnic groups were comparable to the race/ethnic group proportion of children age 6-16 in the U.S. population, based on the 1970 Census survey.

The WISC-III norms were generated using variables similar to those of the WISC-R, except the stratification was based on data from a 1988 U. S. Census study. Any differences between the two norm groups were due to a natural shift in populations between 1970 and 1988; hence

a slight increase occurred in the number of minorities tested and a larger proportion of children from the west and south being used in the WISC-III normative sample. All factors considered, the characteristics of the normings of the two tests, as well as the stratification variables, are surprisingly similar.

Regarding the structure of the two tests, the WISC-III (Wechsler, 1991) includes many items from the WISC-R (Wechsler, 1974), a number of new items, and color graphics on two of the performance subtests. In addition, the order of subtest administration was altered, while directions for administration and scoring were revised. Both scales, however, present IQs adjusted to a mean of 100 and a standard deviation of 15, while all subtest scaled scores have been adjusted to a mean of 10 and a standard deviation of 3.

Because of the WISC-III's relative newness, the only studies comparing the WISC-R and WISC-III are those mentioned in the manual (Wechsler, 1991). To begin, a high correlation between the Verbal Scale (VIQ) scores and the Full Scale (FSIQ) scores, approaching the reliabilities of both scales (.90 and .89, respectively) has been found between the WISC-R and the WISC-III for the normal population. The correlation of .81 between the Performance Scale (PIQ) scores is slightly lower, but

also substantial; thus, the two instruments do appear to be measuring similar abilities.

In a comparison study of a small sample from the norming population (Wechsler, 1991), differences in IQ's have been found between the WISC-R and III. The WISC-III and the WISC-R were administered in counterbalance order to the sample (206 children) aged 6-16 years (median age = 11). The intervals between testings ranged from 12 to 70 days (median = 21 days). The sample consisted of 55% female and 45% male children and 70% White, 19% Blacks, 8% Hispanics, and 3% children of other races/ethnic origin. The FSIQ scores on the WISC-III were approximately 5 points less than the WISC-R FSIQ scores. Also, the VIQ and PIQ scores are approximately 2 and 7 points less than the corresponding WISC-R IQ scores, respectively (Wechsler, 1991).

A further breakdown of the data indicates the WISC-R and III differences are more pronounced at the upper and lower ends of IQ distribution (e.g., above 120 and below 80) and relatively narrow near the center (e.g., 100) (Wechsler, 1991). The average difference between WISC-III and WISC-R FSIQ scores is about 5 points, while at the upper and lower ends of the IQ distribution, the WISC-III FSIQ is 8-9 points less than WISC-R FSIQ score. In

addition, WISC-III and WISC-R PIQ scores can be expected to differ more than VIQ scores do (Wechsler, 1991).

Since the WISC-III will be frequently used with special education children, a beginning has been made in comparing the results of the WISC instruments on such a population. Two comparison studies were cited in the WISC-III manual.

In one study, the WISC-III was administered to 26 children aged 6-16 years (median age = 11 years) who were diagnosed as mildly mentally retarded. The diagnoses were made by independent investigators and based on performance on the WISC-R and a measure of adaptive functioning. The average interval between the two testings with the WISC-III and WISC-R was 2 years, 2 months. The mean WISC-III VIQ, PIQ, and FSIQ scores were 8.9, 6.8, and 8.9 points less than the mean WISC-R IQ scores, respectively (Wechsler, 1991).

In a second study mentioned in the manual (Wechsler, 1991) the WISC-III and WISC-R scores of a clinical sample were compared. The WISC-R scores were obtained for 104 of the children in the clinical validity samples. The children ranged in age from 7-14 years (median age, 10 years). The sample consisted of predominantly male (81%) and White (89%) children, with 5% Black, 4% Hispanics, and 2% of the children of other race/ethnic origin. This subsample included children with various learning

disabilities (57%), children with Attention-Deficit Hyperactivity Disorder (35%), and depression and anxiety disorders (8%). In this clinical sample the correlations of the WISC-R and WISC-III scores were .86 for the VIQ, .73 for the PIQ scores, and .86 for the FSIQ. The WISC-III FSIQ score was 5.9 points less than the WISC-R FSIQ score. Similarly, WISC-III VIQ and PIQ scores were 5.4 and 5.1 points less, respectively, than the corresponding WISC-R IQ scores. Thus, the correlations between WISC-R and WISC-III scores and the mean differences obtained for this mixed clinical sample are of similar magnitude as the results obtained from the nonclinical sample.

Regrettably, when applying the results of these studies to children being served by special education, two major problems arise. First, the sample of 26 mildly mentally retarded students is much too small to be representative. Second, the population used in the mixed clinical sample is not similar to the population being served by special education. A large group of the children in the clinical sample were classified with Attention Deficit Disorder, a learning disorder not recognized or treated by special education. Depression and anxiety disorders are not the behaviors treated in Special Education. Most behaviors dealt with are of the conduct disorder type, such as oppositional behavior, non-compliance and aggression. These

studies appear to indicate higher IQ discrepancies in a mentally retarded population, while a clinical sample tended to equal that of the normal sample.

Because of the above-noted problems, it may be of interest to review comparison studies of the WISC when it was revised in 1974. The WISC-R manual (Wechsler, 1974) does not refer to any comparison studies comparing the WISC to the WISC-R. However, researchers did conduct WISC to WISC-R comparison studies soon after the WISC-R was released, using a variety of special education and normal samples.

The results of the comparison studies (Schwartzing, 1976; Davis, 1977; and Stokes, Brent, Huddleston and Rozier, 1978), using normal children, indicated that children's WISC VS, PS, and FS scores were all significantly higher than their corresponding WISC-R scores. The VS were 2-4 points higher, PS 3-8 points higher and the FS were 3-7 points higher.

Using Educable Mentally Retarded children in Georgia, Hamm, Wheeler, McCallum, Herrin, Hunter and Catoe (1976) found that WISC-R Full Scale scores averaged 7.5 points lower than WISC Full Scale IQs. Van Hagen and Kaufman (1976) reported in a study using factor analysis that even though the WISC-R factors for retarded children are similar to the WISC factors identified for groups of

institutionalized and non-institutionalized mentally challenged, the WISC-R scores were significantly lower (average 8 points Full Scale score). In a longitudinal comparison of the WISC and WISC-R with special education pupils, Thomas (1980) found that the special education pupils scored lower on the WISC-R when tested three years after being given the WISC. } A comparison study of the WISC and WISC-R scores of juveniles referred to a large metropolitan juvenile probation department (Solway, Fruge, Hays, Cody, & Gryll, 1976) found that the juvenile delinquents scored significantly lower on the WISC-R than on the WISC. In a study by Weiner and Kaufman (1979) with black children referred for learning and behavioral disorders, they found that these children's WISC-R scores were consistently lower than on the WISC. The differences were 7 points lower for the Verbal and about 8 points lower for both the Performance and Full Scale. The results of all these WISC to WISC-R comparison studies indicated that the direction of the IQ difference was consistent: children in Special Education scored 6 to 8 points lower on the WISC-R than on the WISC.

A recurring question from all these studies arises. Why are intelligence scores lower whenever the WISC IQ test is revised? The reasons varied slightly from study to study. In the studies by Hamm, et. al. (1976); Van

Hagen & Kaufman (1975); and Weiner & Kaufman (1979), the cited reasons for the higher scores on the WISC than on the WISC-R included earlier maturation and greater test sophistication of the children who were utilized as the norm for the WISC in 1948, and the increasing availability of manipulative materials similar to the Performances subtests. The study by Thomas (1980) stated that the WISC-R is a more difficult test than the WISC which would result in depressed scores not necessarily reflective of the child's capabilities as measured by the WISC. In the WISC-III manual the 1987 study by J. R. Flynn was cited which outlined four possible reasons for the discrepancies in the scores: First, that the inflated IQ scores over time are not real, but an artifact of sampling error. Second, these gains are "semi-real", due primarily to test sophistication of the children. Third, these gains are real, due to the fact that children are getting smarter. Fourth, a combination of all of the above.

Both the earlier WISC and WISC-R discrepancy studies and the recent WISC-R and WISC-III comparison studies (Wechsler, 1991) indicate that using the WISC-III for re-evaluation could have serious implications for special education. Because of the possibility of lower scores on the WISC-III re-evaluations, children classified as learning disabled (1.3 standard deviation, 20 points)

between ability and achievement) might be placed out of a special education program. Their lower IQ scores will fail to make the critical difference between their achievement scores and their ability as measured by the WISC-III. This decision would not have been made had they been tested on the WISC-R, especially if the child was originally placed in a special education program based partially on the WISC-R results. Because of these concerns, a detailed study using a larger data base and a population more relevant to special education should be conducted. It would be beneficial for school psychologists and special educators to know what to expect regarding IQ score decreases when a child is re-evaluated using the WISC-III, if the child was given a WISC-R three years earlier.

The purpose of this investigation was to determine from a sample of children with learning, mental, and behavioral disabilities: (1) the correlations between the WISC-III and WISC-R Verbal, Performance, and Full Scale IQs, and (2) the magnitude of the difference in the IQs and scale scores between the two tests.

Based on the findings of comparison studies between the WISC and WISC-R and the preliminary comparison studies between the WISC-R and WISC-III, the present study should find that, for all children who are re-evaluated for special education placement, the WISC-III yields a lower mean Full

Scale, Verbal, and Performance IQ score than the WISC-R. Furthermore, based on previous research, a greater decrease in IQ scores is expected for the Mental Disability group than for the Learning and Behavior Disability groups because the Mental Disability diagnosis is based mainly on a lower than normal IQ. Also, the Learning and Behavior Disability groups should manifest a decrease in scores from WISC-R to WISC-III of similar magnitude as the results obtained for the normal and nonclinical samples listed in the WISC-III manual (Wechsler, 1991).

Method

Subjects

207 children were selected from the special education files of the Omaha Public School District, a large urban district (134 children, 64%), and several small rural school districts from southwest Iowa (73 children, 46%). The children were initially evaluated and classified under one of the following special education categories: 124 Learning Disabled, 51 Mental Disabled, and 32 Behavior Disabled. There were no significant differences found in the intelligence scores between the urban and rural population for all groups. Also, the children were due

for re-evaluation during the 1991-92 school year and were previously given a WISC-R.

Procedure

The children were previously evaluated (using only the WISC-R) and classified as learning disabled, behavior disabled, or mental disabled. They were re-evaluated during the 1991-1992 academic year using the WISC-III. The approximate time between WISC-R and WISC-III was three years. The testing of the subjects was done by a certified school psychologist or by personnel qualified to give the WISC-R and WISC-III; standard administration procedures were used for all subjects. Each participating psychologist submitted only files where the full test (10 subtests) of both the WISC-R and the WISC-III were given. The students' names do not appear on the protocols (only age, sex, disability and date the WISC-R and WISC-III is given)---thereby assuring the confidentiality of each subject.

Because the children in the sample were taken from schools in both Nebraska and Iowa (states which vary in the qualifications of a learning disability and mental disability) a clear definition of these disabilities was needed in order to avoid confusion. In Iowa, a child needs an IQ below 85 to qualify as having a "mild mental disability", while Nebraska only recognizes children below

80. In both states a certain score on an IQ test is only one of the criteria for a mental disability. In the present study only children who meet the Nebraska qualification (IQ below 80) will be used in the mental disability group. Iowa uses the definition of more than one standard deviation (15 points) between an IQ test and an achievement test as the criterion for a learning disability, while Nebraska requires a 20-point discrepancy. The present study will use the more restrictive Nebraska definition for learning disability. Only those children with a 20-point difference between IQ test and achievement will be used as having a learning disability group. Students in Iowa who failed to make the 20 point cut off were excluded from the study.

Results

A summary of the obtained means and standard deviations and t-ratios for all three groups are presented in following tables: Table 1, Mild Mental Disability; Table 2, Behavior Disability; and Table 3, Learning Disability. Inspection of the obtained means indicates that WISC-R VS, PS, and FS scores were significantly higher than for the corresponding WISC-III for the Learning Disability, Behavior Disability and Mental Disability groups.

Table 1

WISC-R and WISC-III Mean Scores and t-Values (Mental Disability)

	WISC-R mean	WISC-R SD	WISC-III mean	WISC-III SD	df	WISC- R >III	t
Full Scale IQ	67.67	9.09	60.53	7.81	50	7.14	9.11***
Verbal IQ	68.43	8.53	62.16	7.98	50	6.27	7.15***
Subtest							
Information	4.63	2.03	3.80	2.07	45	.83	3.29**
Similarities	5.44	2.48	3.33	2.03	45	2.11	5.43***
Arithmetic	4.04	2.06	3.20	1.88	45	.84	2.25
Vocabulary	5.04	1.74	3.15	1.80	45	1.89	5.96***
Comprehension	5.04	2.31	3.09	1.95	45	1.95	5.74***
Performance IQ	71.71	11.54	65.27	10.32	50	6.64	5.62***
Subtest							
Picture Comp.	6.44	2.19	3.87	2.79	45	2.57	8.35***
Picture Ar.	5.37	3.01	4.33	2.09	45	1.04	2.52
Block Design	5.02	2.68	2.84	2.06	45	2.18	5.76***
Obj. Assembly	5.78	2.44	4.43	2.16	45	1.35	4.37***
Coding	6.00	2.82	5.17	2.78	45	.83	2.11

Average age of child at WISC-III was 12.2

** p < .01.

*** p < .001

(6 children did not have WISC-R subtest scores)

Table 2

WISC-R and WISC-III Means Scores and t Values (Behavior Disability)

	WISC-R mean	WISC-R SD	WISC-III mean	WISC-III SD	df	WISC-R > WISC-III	t
Full Scale IQ	89.40	15.90	83.53	15.95	31	5.87	4.05***
Verbal IQ	90.50	16.65	85.31	14.54	31	5.19	3.28**
Subtest							
Information	8.68	3.97	7.24	3.24	31	1.44	2.72**
Similarities	9.20	3.68	8.10	2.66	31	1.10	1.53
Arithmetic	7.52	2.79	6.97	3.01	31	.55	.49
Vocabulary	9.00	2.60	7.24	2.73	31	1.76	5.86***
Comp.	9.32	2.51	8.37	3.12	31	.95	1.51
Performance IQ	90.41	15.45	84.16	17.46	31	5.98	3.16**
Subtest							
Picture Comp	8.58	2.84	8.29	3.58	31	.29	.46
Picture Ar.	9.46	3.37	8.70	4.11	31	.76	1.41
Block Design	8.37	2.46	5.65	3.44	31	2.72	6.66***
Obj. Assembly	9.25	3.27	7.43	3.01	31	1.82	5.94***
Coding	8.62	3.17	8.50	3.97	31	.12	.31

Average age of child at WISC-III was 12.2

** p < .01.

*** p < .001.

Table 3

WISC-R and WISC-III Mean Scores and t-Values (Learning Disability)

	WISC-R mean	WISC-R SD	WISC-III mean	WISC-III SD	df	WISC-R > III	t
Full Scale IQ	94.60	10.25	89.52	10.07	123	5.08	8.12***
Verbal IQ	91.15	11.20	87.67	11.04	123	3.48	5.44***
Subtest							
Information	7.84	2.28	7.74	2.15	96	.45	.10
Similarities	9.38	2.87	8.87	2.66	96	.51	1.74
Arithmetic	7.65	2.26	6.86	2.22	96	.79	3.59**
Vocabulary	8.99	2.45	7.73	2.42	96	1.26	7.68***
Comprehension	9.45	2.81	8.30	2.84	96	1.15	4.07***
Performance IQ	99.69	11.44	93.36	12.35	123	6.33	7.10***
Subtest							
Picture Comp.	10.80	2.24	9.92	2.60	96	.88	3.09**
Picture Ar.	10.81	2.88	9.11	2.75	96	1.70	4.79***
Block Design	9.65	2.45	8.60	2.97	96	1.05	4.46***
Object Assembly	9.88	2.72	9.13	2.57	96	.75	2.70**
Coding	8.56	3.01	8.06	3.02	96	.50	1.54

Average age of child at WISC-III was 12.6

** p < .01.

*** p < .001

(27 children did not have WISC-R subtest scores in their special education file only; Verbal, Performance, Full Scale)

Table 4

Correlation Between Subtest and IQ Scores on the WISC-III
and the WISC-R on a Normal Sample (n = 206)

	WISC-R	WISC-R	WISC-III	WISC-III	R	WISC-R
	mean	SD	mean	SD	12	> WISC-III
Full Scale IQ	108.2	15.1	102.9	14.7	.89	5.3
Verbal IQ	103.9	14.7	101.5	14.5	.90	2.4
Subtest						
Information	10.1	2.9	10.4	3.1	.80	-.2
Similarities	11.6	3.1	10.3	3.0	.74	.3
Arithmetic	10.5	2.9	10.2	3.0	.67	.3
Vocabulary	10.5	2.8	10.1	3.1	.77	.4
Comp.	10.7	3.1	10.1	3.2	.67	.6
Performance IQ	111.6	15.4	104.2	15.1	.81	7.4
Subtest						
Picture Comp	11.5	2.9	10.6	3.2	.57	.9
Picture Ar.	12.5	3.1	10.6	3.3	.42	1.9
Block Design	11.3	3.4	10.4	3.4	.76	.9
Obj. Assembly	11.5	3.4	10.3	3.2	.58	1.2
Coding	11.6	3.6	10.9	3.7	.70	.7

Table was compiled from data provided in WISC-III manual (Wechsler, 1991).

The WISC-R and the WISC-III were administered in counter balanced order to a sample of 206 children aged 6-16 years (median age = 11).

The Mental Disability group had the greatest differences between scores with the WISC-R FS being 7.14 points ($t = 9.11$, $p < .001$), VS 6.27 ($t = 7.15$, $p < .001$), and the PS 6.64 ($t = 6.64$, $p < .001$) higher than WISC-III. The differences in the Behavior Disability group were FS 5.87 ($t = 4.05$, $p < .001$), PS 5.98 ($t = 3.16$, $p < .01$), and VS 5.19 ($t = 3.28$, $p < .01$) lower than WISC-R scale scores. The decreases in the Learning Disability group IQs were of the following magnitude: FS = 5.08 points ($t = 8.12$, $p < .001$), VS = 3.48 points ($t = 5.44$, $p < .001$), and PS = 6.33 points ($t = 7.10$, $p < .001$). It may be noted that these differences are similar to the results of the comparison test on the clinical population and normal sample reported in the Wechsler manual (see Table 4). For all three groups, the Performance scale had the greatest drop in scores from WISC-R to WISC-III; the Verbal scale appeared to drop the least.

Although the WISC-R mean IQ scores were significantly higher than the WISC-III for all groups, there was a significant correlation coefficient on all three scores for all groups, as depicted in Table 5.

Table 5

Correlation WISC-R to WISC-III(Special Education)	
Mild Mental Disability:	VS = .84, PS = .72, and FS = .86
Learning Disability:	VS = .87, PS = .76, and FS = .89
Behavior Disability:	VS = .85, PS = .77, and FS = .87

Comparisons of subtest scores for all three groups revealed significant differences between the WISC-R and WISC-III samples. For the Mild Mental Disability group six subtests were significantly lower ($p < .01$ level) for the WISC-III: Similarities, Vocabulary, Comprehension, Picture Completion, Block Design, and Object Assembly. The remaining subtests were lower but not at a significant level. The means, standard deviations, t -score and point differences for each subtest is broken down in Table 1. As can be seen in Table 3, the Learning Disability group had all but three subtests with a significant decrease from WISC-R to WISC-III: Arithmetic, Vocabulary, Comprehension, Picture Completion, Picture Arrangement, and Block Design. The Behavior Disability group had significant differences between the WISC-R and WISC-III samples on the following subtests: Information, Similarities, Vocabulary, Block Design, and Object Assembly. A complete breakdown of means, standard deviations, t -score and point differences for each subtest is detailed in Table 2. It should be noted that while none of the three groups'

WISC-III subtest's means were higher than the WISC-R, some subtests differences failed to be significant ($p < .01$ level).

Table 6 compares the magnitude of the drop from WISC-R to WISC-III for the special education groups compared with the normal sample. Using an analysis of variance of unequal cells, significant differences were found on the Verbal Scale IQ for all three disability groups: Learning Disability ($F = 7.34, p < .01$); Behavior Disability ($F = 5.07, p < .01$); Mild Mental Disability ($F = 26.64, p < .001$). However, only the Mild Mental Disability group had a significant difference from the normal sample regarding the change in the Full Scale IQ scores ($F = 13.14, p < .001$). No significant differences were found for changes on the Performance Scale IQ for any of the three disability groups, when compared to the normal sample, although the Performance Scale shows the greatest drop for each group.

Table 7 depicts the results of forward stepwise regression analysis which was performed on each group to generate equations that can be used to predict WISC-III Verbal, Performance, and Full Scale IQ. The main purpose of regression equations is to predict the most likely score in one variable from the obtained score on another variable.

Table 6

Mean IQ Decrease for Special Education Populations

vs Normal Population

Learning Disability (LD) vs Normal Sample (NS) (Wechsler, 1991)

	(LD) WISC-R > WISC-III	(NS) WISC-R > WISC-III	F test
Full Scale IQ	5.08	5.30	1.69
Verbal IQ	3.48	2.40	7.34*
Performance IQ	6.33	7.40	3.31

Behavior Disability (BD) vs Normal Sample (NS) (Wechsler, 1991)

	(BD) WISC-R > WISC-III	(NS) WISC-R > WISC-III	F test
Full Scale IQ	5.87	5.30	.32
Verbal IQ	5.19	2.40	5.07*
Performance IQ	5.98	7.40	1.89

Mental Disability (MD) vs Normal Sample (NS) (Wechsler, 1991)

	(MD) WISC-R > WISC-III	(NS) WISC-R > WISC-III	F test
Full Scale IQ	7.14	5.30	13.14*
Verbal IQ	6.27	2.40	26.64*
Performance IQ	6.64	7.40	1.26

* p < .01.

Table 7

Regression Equations to Predict WISC-III for Special
Education Population

Learning Disability: Regression Equations

$$.778 \text{ X (WISC-R VIQ)} + 16.85 = \text{WISC-III VIQ}$$

$$.715 \text{ X (WISC-R PIQ)} + 22.10 = \text{WISC-III PIQ}$$

$$.776 \text{ X (WISC-R FSIQ)} + 15.95 = \text{WISC-III FSIQ}$$

Mental Disability: Regression Equations

$$.668 \text{ X (WISC-R VIQ)} + 16.46 = \text{WISC-III VIQ}$$

$$.650 \text{ X (WISC-R PIQ)} + 18.50 = \text{WISC-III PIQ}$$

$$.680 \text{ X (WISC-R FSIQ)} + 14.52 = \text{WISC-III FSIQ}$$

Behavior Disability: Regression Equation

$$.970 \text{ X (WISC-R VIQ)} + 7.86 = \text{WISC-III VIQ}$$

$$.680 \text{ X (WISC-R PIQ)} + 33.07 = \text{WISC-III PIQ}$$

$$.860 \text{ X (WISC-R FSIQ)} + 17.19 = \text{WISC-III FSIQ}$$

The regression coefficient indicates how many units the predicted score increases for every increase of one unit in the obtained score. The constant term is added to insure that the mean of the predicted scores will equal the mean of the obtained scores. These equations will enable the diagnostician to compute a "best-estimate" of what the WISC-III scores would be, using actual WISC-R scores.

Discussion

A comparison of the mean IQs supports the original hypothesis that the WISC-III consistently yields lower IQs for all groups in special education. The scores for the Mild Mental Disability group were 7.14 points lower for the Full Scale, 6.64 points lower for Performance, and 6.27 points lower for the Verbal Scale. The Learning Disability group had differences averaging 5.08 points for the Full Scale, 3.48 points for the Verbal scale, and 6.33 points for the Performance scale. These results are congruent with results reported in the WISC-III Manual for comparison studies with somewhat similar populations. The Behavior Disability group also experienced a decline in IQ scores from the WISC-R to WISC-III after a 3-year interval. Decreases in the magnitude of 5.87 points for the Full Scale, 5.19 points for the Verbal Scale, and 5.98 points for the Performance Scale were obtained. All differences were significant at the .01 level.

When comparing the results of the three disability groups to the comparison study of the normal sample (Wechsler, 1991), there is a significant difference between Verbal Scale IQ's (see Table 6). This is congruent with a number of studies (Kirk & Kirk, 1971; Anderson, Kaufman, et al., 1976; Smith, Coleman, et al., 1977; and Zingale

and Smith, 1978) that indicated that children in special education tend to have Wechsler Verbal Intelligence subtest profiles different than their normal peers, with Verbal IQ and Verbal subtests being significantly lower. The Mild Mental Disability group also had a significant difference in Full Scale IQ when compared to the normed sample. There was no difference between any of the special education groups and the normed sample when it came to the magnitude of change on the Performance IQ. These results support the hypothesis that children with a Mild Mental Disability manifest greater differences between WISC-R and WISC-III scores than their normal peers. The hypothesis stating that children with a learning disability and behavior disability should manifest similar decreases between WISC-R and WISC-III scores compared to the normal population is partially rejected because of the significant differences found on their Verbal Scale scores. Full Scale IQ's and Performance IQ's for both groups were not significantly different, however.

The lower IQs on the WISC-III than the WISC-R are in agreement with the changes in the Wechsler series norms over the past 40-year period (Wechsler, 1991). Perhaps the children of today are more informed and advanced intellectually than children tested a generation ago, and thus the current norms become steeper. Kaufman (1979)

attributed the changes in the WISC-R norms in 1975 to factors such as educational and cultural changes and the influence of mass media: these factors could also account for the differences in the WISC-R and WISC-III norms.

Interpretation of the shifts in particular subtests or IQs for each group is at best speculative. It would be very difficult to design a study to identify the causes of the significant decrease in test scores; however, a number of hypotheses for each group may be generated to explain the decrease. Perhaps the decrease was provided by the characteristics of the normative sample. Specifically, the new sample is more competent in visual-motor coordination, resulting in the greatest decrease in Performance IQ. These decreases could reflect the increasing emphasis on early childhood education, such as perceptual motor functioning in preschool and grade school. Another factor may be the changes in the home environment. Since the norming of the WISC-R in 1974, there has been an explosion of home video games which put a premium on perceptual motor functioning. Since the average child spends a great deal of his free time playing these video games which improve perceptual motor functioning, the resulting large decreases in Performance IQs may be due to a "NINTENDO" effect.

Regarding the decrease of Verbal IQ, there is a somewhat different subtest pattern for each group. For the Learning Disability group, the two verbal subtests, Vocabulary and Comprehension, showed a significant decrease from WISC-R to WISC-III. They also were the most extensively revised from WISC-R to WISC-III. Thirteen items on the WISC-R Vocabulary subtest were dropped because they proved to be either technically unsuitable or outdated. The WISC-III includes the remaining 19 items from the WISC-R and 11 new items, for a total of 30 items, an overall decrease of two items. Five items from the WISC-R were dropped from the Comprehension subtest for the same reasons as noted above. The 12 remaining items are either unchanged or slightly reworded. The WISC-III includes 6 new items, for a total of 18 items, which is an increase of 1 item. With so many items dropped, added, and revised, the argument can be made that the differences in scores between the two subtests on the WISC-R and WISC-III are due to the revisions and not to a change between the two norming populations on expressive verbal ability.

When comparing the 10 verbal subtest scores for the Mild Mental Disability group obtained using the WISC-III with those scores obtained using the WISC-R, three of those subtests (Similarities, Vocabulary and Comprehension) showed significantly lower scores. On these tests, the subject

has to give longer and more expressive verbal replies than the other verbal subtests which require short (essentially one-word) responses. Studies have shown (Bricker & Bricker, 1972; Daly, Cantrell, Cantrell, & Amam, 1972; Kauffman & Payne, 1975) that children with low IQs have difficulty with verbal expression. Special education programs, which were few in number before Public Law 94-142 became effective in 1975, may now remedy this difficulty. In fact, the decrease experienced on the Verbal IQ for the Mild Mental group, as well as the other two special education groups, may be the result of enrichment in the Special Education classroom in the area of verbal expressive skills which the 1974 WISC-R normed group was not exposed to. The special education population of today may be more advanced verbally due to this extra help; thus, the steeper verbal norms on the WISC-III for the special education groups.

In fact, the significant decrease in the Full Scale IQ of 7 points between the WISC-R and WISC-III for the Mild Mental disability group, as well as greater Verbal IQ drops for all special education groups compared to their normal peers, could be explained by the impact of Public Law 94-142, Education for All Handicapped Children Act, 1975, which mandated special education programs for all states. Although these programs could have enriched the

educational experience of children who were classified as Mild Mental Disabled, this would seem somewhat unlikely since similar drops in IQ were experienced for this group when the WISC was originally renormed in 1974, before Public Law 94-142. One could argue that the period between 1948, when the WISC was normed, and 1974, when the WISC-R was normed, saw a dramatic increase in the educational opportunities for the mentally handicapped (Kauffman & Payne, 1975). The steeper norms for this group on the WISC-III quite possibly could be the result of the success of these interventions.

Children tested with the WISC-III might be placed out of or placed in a different special educational program on the basis of their lower scores. There is a concern that this decision would not have been made had they been tested using the WISC-R. Each school psychologist who submitted data for this study also indicated whether the change in IQ scores from the WISC-R to the WISC-III on the three-year re-evaluation could have changed special education programming. It must be noted that those concerns did translate into some actual changes in the special education program. Out of the sample of 207 children who were re-evaluated, 43 could have been reclassified in special education based on their lower WISC-III scores.

Since the government spends billions of dollars on special education programs, any changes in placements would seriously affect funding of these programs. This concern could be alleviated somewhat for learning disability children by insuring that only achievement tests with the most current norms are used, in conjunction with the new WISC-III.

One may conclude that children seem to obtain WISC-III IQs that are about 5-7 points below their WISC-R IQs, depending on their disability. A difference of this magnitude is substantial and must be considered carefully by test users. Examiners who are accustomed to the WISC-R must make a mental adjustment when using the WISC-III. Since psychologists usually give only one IQ instrument to a child in a three-year re-evaluation, the presence of a systematic difference in IQ scores provided by the WISC-R and WISC-III should be taken into consideration whenever a decision in the placement of a child in special classes is made. Clinicians who compare a child's WISC-III IQs with earlier WISC-R IQs must be cautious before inferring a loss in the child's functioning: lower IQs are to be expected whenever an IQ test is revised and renormed (Flynn, 1980).

As a final comment on intelligence tests in general, typical intelligence tests designed for use in our culture

with school-age children or adults measure largely verbal abilities; to a lesser degree, they also cover abilities to deal with numerical and other abstract symbols. These are the abilities that predominate in school learning. Most intelligence tests can therefore be regarded as measures of scholastic aptitude. The IQ is both a reflection of prior educational achievement and a predictor of subsequent educational performance. Because the functions taught in the educational system are of basic importance in our culture, the IQ is also an effective predictor of performance in many occupations and other activities of adult life.

On the other hand, there are many other important functions that intelligence tests have never undertaken to measure. Mechanical, motor, musical, and artistic aptitudes are obvious examples. Motivational, emotional, and attitudinal variables are important determiners of achievement in all areas. Current creativity research is identifying both cognitive and personality variables that are associated with creative productivity. All this implies, of course, that both individual and institutional decisions should be based on as much relevant data as can reasonably be gathered. To base decisions on tests alone, and especially on one or two tests alone, is clearly a

misuse of tests. Decisions must be made by persons. Tests represent one source of data utilized in making decisions; they are not themselves decision-making instruments (Sattler, 1988).

In conclusion, the data from the comparison study between WISC and WISC-R supports the hypothesis that students in the special education population tend to have significantly lower IQs on the WISC-III compared to the previous WISC-R's. The data also supports the hypothesis that the Mild Mental Disability group tend to have significantly lower Full Scale IQ drops compared to their normal peers. Results from the data also indicate that students in the behavior and learning disability groups have Full Scale IQ drops which are not significantly different from their normal peers. Although for all three disability groups, WISC-III Verbal IQs dropped significantly more than their normal peers; there were no significant decreases in performance IQs.

References

- Anderson, M., Kaufman, A. S., and Kaufman, N. L., (1976). Use of the WISC-R with a learning disabled population: Some diagnostic implications. Psychology in the Schools, 13, 381-386.
- Bricker, W. A., Bricker, D.D. (1972). Assessment and modification of verbal imitation with low functioning children. Journal of Speech and Hearing Research, 15, 690-98.
- Daly, D. A., Cantrell, R. P., Cantrell, M., & Aman, L. A. (1972). Structuring speech therapy contingencies with low functioning children. Journal of Speech and Hearing Research, 37, 22-32.
- Davis, E. E. (1977). Matched pair comparison of WISC and WISC R scores. Psychology in the Schools, 14, 161-166.
- Flynn, J. R. (1987). Massive IQ gains in 14 nations: What IQ tests really measure. Psychological Bulletin, 101, 171-191.
- Hamm, H., Wheeler, J., McCallum, S., Herrin, M., Hunter, D., Catoe, C. (1976) A comparison between the WISC and WISC-R among educable mentally retarded students. Psychology in the Schools, 13, 4-8.
- Kauffman, J. M., Payne, J. S. (1975). Mental Retardation: Introduction and Personal Perspectives. Columbus, OH: Charles E. Merrill Publishing Co.

- Kirk, S. A., and Kirk, W. D., (1971). Psycholinguistic Learning Disabilities, Illinois U. P., Urbana.
- Public Law 94-142, Education for All Handicapped Children Act, November 29, 1975.
- Sattler, J. M. (1988). Assessment of Children (3rd ed.). San Diego: Jerome Sattler.
- Schwarting, F.G. (1976). A comparison of the WISC and WISC-R. Psychology in the Schools, 13, 139-141.
- Smith, M. D., Coleman, J. M., Doeckki, P. R., and Davis, E. E., (1977). Recategorized WISC-R scores of learning disabled children. Journal of Learning Disabilities, 10, 444-449.
- Solly, D. C. (1977). Comparison of WISC and WISC-R scores of mentally retarded and gifted children. Journal of School Psychology, 15, 255-258.
- Solway, K. S., Fruge, E., Hays, J. R., Cody, J., & Gryll, S. (1976). A comparison of the WISC and WISC-R in a juvenile delinquent population. Journal of Psychology, 94, 101-106.
- Stokes, E. H., Brent, D., Huddleston, N.J., Rozier, J. S., & Marrero, B. (1978). A comparison of WISC and WISC-R scores of sixth grade students: Implications for validity. Educational and Psychological Measurement, 38, 469-473.

- Thomas, P. J. (1980) longitudinal comparison of WISC and WISC-R with special education pupils. Psychology in the Schools, 17, 437-441.
- Van Hagen, J., Kaufman, A. S. (1975). Factor analysis the WISC-R for a group of mentally retarded children and adolescents. Journal of Consulting and Clinical Psychology, 43, 611-677.
- Wechsler, D. (1974). Manual for the Wechsler Intelligence Scale for Children-Revised Edition. San Antonio, TX: The Psychological Corporation.
- Wechsler, D. (1991). Manual for the Wechsler Intelligence Scale for Children-Third Edition. San Antonio, TX: The Psychological Corporation.
- Weiner, S. G., Kaufman, A. S. (1979). WISC-R versus WISC for black children suspected of learning or behavioural disorders. Journal of Learning Disabilities, 12, 100-107.
- Zingale, S. A., and Smith, M. D., (1978). WISC-R patterns for learning disabled children at three SES levels. Psychology in the Schools, 15, 199-204.